## CLAIMS

We Claim:

1 A method for optimizing a netlist change order flow, wherein a design layout created by a layout tool from a reference netlist is to be changed by a modified version of the netlist, wherein both netlist are hierarchical comprising;

(a) comparing the modified netlist with the original netlist outside of the layout tool;

(b) automatically generating at least one change order based on differences found between the two netlists; and

(c) applying the change order to the design layout to generate a modified design layout.

2 The method of claim 1 further including the step of: providing a software tool for performing steps (a) and (b).

3 The method of claim 2 wherein step (a) further includes the step of: inputting the reference netlist and the modified netlist into the software tool.

4 The method of claim 3 wherein step (a) further includes the step of: comparing the reference netlist and the modified netlist in a flat manner.

5 The method of claim 4 wherein step (a) further includes the step of: creating flat views for both the reference netlist and the modified netlist.

6 The method of claim 5 wherein step (a) further includes the step of: generating two data structures corresponding to each of the flat views, an instance map and a net map.

7 The method of claim 6 wherein step (a) further includes the step of: maintaining in each of the instance maps a mapping of hierarchical leaf-level instance names and corresponding instance types, wherein modules are excluded.

8 The method of claim 5 wherein step (a) further includes the step of: maintaining in each of the net maps a list of nets and corresponding pins for the nets across all module hierarchies.

9 The method of claim 8 wherein step (a) further includes the step of: using a top-net is to represent a net across hierarchies and representing the pins for the net as a set.

10 The method of claim 9 wherein step (a) further includes the step of: assuming that a name of the net in the design layout is same as the top-net name.

11 The method of claim 9 wherein step (a) further includes the step of: comparing the flat views of the modified netlist with the flat views of the reference netlist by,

(i) sequentially reading and comparing the leaf cells in the instance maps; and

(ii) comparing the net map for the modified netlist with the net map for the reference netlist.

12 The method of claim 6 wherein step (b) further includes the step of: generating an ECO in response to any one of the following: 1) a leaf cell is in the reference instance map, but not in the modified instance map; 2) a leaf cell is in the modified instance map, but not in the reference instance map; 3) a leaf cell is in both instance maps, but there is a cell type mismatch.

13 The method of claim 2 wherein step (c) further includes the step of: inputting the change orders into the layout tool to apply the changes and to generate the modified layout.

14 A computer-readable medium containing program instructions for optimizing a netlist change order flow, wherein a design layout created by a layout tool from a reference netlist is to be changed by a modified version of the netlist, wherein both netlist are hierarchical, the program instructions for:

(a) comparing the modified netlist with the original netlist outside of the layout tool;

(b) automatically generating at least one change order based on differences found between the two netlists; and

(c) applying the change order to the design layout to generate a modified design layout.

15 The computer-readable medium of claim 14 further including the instruction of: providing a software tool for performing instructions (a) and (b).

16 The computer-readable medium of claim 15 wherein instruction (a) further includes the instruction of: inputting the reference netlist and the modified netlist into the software tool.

17 The computer-readable medium of claim 16 wherein instruction (a) further includes the instruction of: comparing the reference netlist and the modified netlist in a flat manner.

18 The computer-readable medium of claim 17 wherein instruction (a) further includes the instruction of: creating flat views for both the reference netlist and the modified netlist.

19 The computer-readable medium of claim 18 wherein instruction (a) further includes the instruction of: generating two data structures corresponding to each of the flat views, an instance map and a net map.

20 The computer-readable medium of claim 19 wherein instruction (a) further includes the instruction of: maintaining in each of the instance maps a mapping of hierarchical leaf-level instance names and corresponding instance types, wherein modules are excluded.

21 The computer-readable medium of claim 18 wherein instruction (a) further includes the instruction of: maintaining in each of the net maps a list of nets and corresponding pins for the nets across all module hierarchies.

22 The computer-readable medium of claim 21 wherein instruction (a) further includes the instruction of: using a top-net is to represent a net across hierarchies and representing the pins for the net as a set.

23 The computer-readable medium of claim 22 wherein instruction (a) further includes the instruction of: assuming that a name of the net in the design layout is same as the top-net name.

24 The computer-readable medium of claim 22 wherein instruction (a) further includes the instruction of: comparing the flat views of the modified netlist 48 with the flat views of the reference netlist by,

(i) sequentially reading and comparing the leaf cells in the instance maps; and

(ii) comparing the net map for the modified netlist 48 with the net map for the reference netlist.

25 The computer-readable medium of claim 19 wherein instruction (b) further includes the instruction of: generating an ECO in response to any one of the following: 1) a leaf cell is in the reference instance map, but not in the modified instance map; 2) a leaf cell is in the modified instance map, but not in the reference instance map; 3) a leaf cell is in both instance maps, but there is a cell type mismatch.

26 The computer-readable medium of claim 15 wherein instruction (c) further includes the instruction of: inputting the change orders into the layout tool to apply the changes and to generate the modified layout.